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X.—On a minute Alga which colours Ballydrain Lake, in the county of Antrim. By WM. THOMPSON, Esq., Vice-Pres. Nat. Hist. Society of Belfast.

JULY 25, 1838.—Late in the autumn of 1837 I observed patches of a singular looking blueish green scum at the edge of Ballydrain Lake—a beautiful and picturesque sheet of water situated a few miles from Belfast*—but being hurried at the time, I did not procure specimens for examination. This I had intended to do a few days afterwards, but circumstances prevented its accomplishment at that time, and when I soon afterwards returned the plant had disappeared. On visiting

* Ballydrain Lake covers about twenty acres of a sandy and peaty soil, and its elevation above the sea is perhaps forty feet. It is of various depth, is fed by springs, and has an outlet in but one small brook. During winter it is the daily haunt of great numbers of wild fowl (*Anatidæ*) of various species, that resort to it as a secure asylum; and I am happy to say not in vain, for agreeably to the good taste of its proprietors, a shot is not permitted to be fired upon it; but, notwithstanding, these most attractive birds have been on the decrease for the last few years. In fishes, mollusca, or other plants than those here treated of (unless more microscopic species remain to be discovered), it possesses no peculiarities. *Myriophyllum*, buck-bean (*Menyanthes*), and the larger phenogamic plants generally, have much increased of late years, to the detriment of pike-fishing, the vegetation near the edges being so dense as to conceal the bait placed on night lines for the capture of these fish.

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On inquiry from some relatives, whose demesne is situated on the borders of the lake, I learned that the appearance described had been observed only for the last four or five years, and for about three months in each year: one of my friends had looked upon its approach with dread, as it interfered so much with his angling that during the period of its continuance this sport had to be abandoned. Eels, pike, and perch, especially the latter, are abundant in the lake, but when the water is clouded by this plant, the diminution in the number of perch taken is said to be not less than about one to fifty—the difference is attributed to the fish being unable to see the bait. About the 1st of this month I am informed that the water was perfectly clear.

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Sept. 16.—I again went to the lake, and found it to be much more densely coloured than on the 30th of July. The day being perfectly calm, the surface of the water was covered to some extent, where the depth appeared to be about five or six feet, with an alga of a pale but rich green hue. When attentively observed it was seen moving in currents presenting the form of what is technically called "the feather" in the most admired mahogany, now moving round a centre or "knot," and again diverging from it rapidly and in the most graceful forms, the water appearing through the moving masses of the plant so as to take the place of the darkest hues and knots in the wood. It was perhaps an appearance similar to this, that MM. Engelhardt and Treschel have described the *Oscillatoria rubescens*,—a minute alga which tinges with a red colour the lake of Morat in Switzerland,—occasionally to assume, when,

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Sept. 26.—On visiting the lake this afternoon, which was fine, though dull and without sunshine, (as the earlier part of the day had been,) I remarked that the water generally had lost some degree of its opacity and looked clearer than on the 16th. Instead of the beautiful appearance which the surface presented upon that day, there was in some places merely a little scum, which excepting its very pale greenish tinge, resembled precisely the appearance remaining on the surface of water in which ice has been dissolved. Towards the edge of the lake, there were in some places, as on the 16th, gelatinous tufts of a pale blue colour; in one place crowded together in a mass which covered an area a few yards in extent. These were generally of greater consistence than on the 16th. The portion nearest the edge had, apparently from decay, become ferruginous, and strongly tinged with rust colour the paper on which it was placed, but with the greatest pains I could hardly obtain a trace of the blue colour. The masses, both blue and ferruginous, were very slippery to the touch, about an inch in thickness, and of considerable consistence, more so than sea-jellies or *Medusæ* generally are, or like that of an oyster; and on being lifted out of the water in a wire-gauze net, remained there without diminution by dripping off or otherwise: their weight too was great. When brought near they had somewhat of the offensive smell of water in which flax had been steeped, and at a short distance from one part of the lake this disagreeable odour was sensibly perceived.

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Sept. 27.—I went out this morning (which was beautiful and with bright sunshine) soon after eight o'clock to observe this plant further, and from a greater display of it upon the surface than yesterday, considered that the heat of the sun might have attracted it thither. I had previously observed, that in perfectly calm weather, it, like the *Oscillatoria æruges-cens*, &c., is disposed to ascend to the surface; it was now evidently beginning to assume the graceful and attractive forms remarked on the 16th. By fixing a phial to my net and skimming the greenish surface with it, I ascertained to a certainty that this surface plant was of the species under consideration. In addition to what was mentioned yesterday of the water of the lake having lost some of its opacity, it may be stated, that where a foot in depth it now in some places is perfectly clear, but in others where it is from two to three feet, it appears when the sun shines upon it of a very pale blue; whether this be an optical deception or be owing to the plant in progress of decomposition, I cannot presume to state.

Oct. 7.—This plant and the *Aphanizomenon* (hereafter to be particularly noticed), both of which were obtained on the 27th Sept., have now entirely disappeared from the lake, the water throughout its depth as well as at the surface being clear and pure: since the day last named there has been no change of weather to produce this effect, the days having been uniformly warm and fine, and the nights with very little frost for this advanced period of the year.

The following additional notes were made in 1839.

July 3.—I was rowed all over the lake, and observed the alga dispersed throughout the entire water, but rather sparingly, and not to such an extent as to tinge or conceal the bottom in any place; it appeared like metallic points wherever the sun shone upon it; for some weeks it has been observed, and was first noticed about the 6th of June. On the present occasion I had the pleasure of being accompanied by P. J. Selby, Esq. and the Rev. Edward Bigge, of Merton College, Oxford.

Sept. 23.—The lake was quite clear, and in a few places the remains only of the blueish masses which indicate the disappearance of the plant for the season were visible, and these

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were in sheltered spots in the midst of a flotilla of *Aphanizomenon*, which was still abundant in a few creeks.

Sept. 25.—With the desire that my friend Mr. W. H. Harvey, now in Dublin, should have the opportunity of investigating both plants in a *recent* state, I visited the lake in the hope of procuring them. The water looked perfectly clear as on the 23rd, but going into the boat I at once saw on looking down into the lake where the sun struck upon it, that the spiral alga was still there, though very sparingly; I brought some up in phials. The water was slightly agitated today and consequently none of the *Aphanizomenon* was obtained.

I have been thus particular in noting the observations on this plant just as they were made from time to time, chiefly to show that the species undergoes no change whatever either in size or otherwise from its first appearance as a colouring matter until about three months afterwards, when decomposition ensues and it is utterly dissolved. In consequence of the great changes that some species of *Algæ* do really undergo, and the conjectures of botanists that others which have not been investigated are likewise subject to them, I took much interest in attending to this point during the time that this alga plays such a prominent part in the waters of the lake.

On examining this plant when first obtained, I could only say that it did not belong to any British genus with which I was acquainted, and no further attention was then given to it. M. Morren, Professor of Botany in the University of Liège, and well known to have successfully studied the freshwater *Algæ* of Flanders, on his visit to Dublin in the following month (Aug. 1838) was shown some sketches of the plant which I had communicated to Miss Ball—a lady who has given much attention to the *Algæ* of Ireland, and made therein some interesting discoveries—and he referred them to the genus *Anabaina* of Bory St. Vincent. With the genus *Sphæroplea*, Ag., in its last or *free state*, my species would however as well agree as with *Anabaina*. Except in the specific difference of being much more minute and more regularly spiral, it resembles the *Sphæroplea crispa*, Berk.* in this state, but

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As my species does not correspond with any *Anabaina* of Bory's, I venture to characterize it as follows :

Anabaina? spiralis, mihi. *A.* consisting of an extremely minute moniliform thread of a rich green colour, and regularly spiral like a corkscrew; globules of equal size throughout its entire length.

The specimens obtained were invariably of similar breadth and rarely presented more than four spiral turns, and when of this size were $\frac{1}{30}$ of an inch in length. The species at first, when mingling with the water, is of a dark green colour : when in calm weather it ascends to the surface in *separate* particles, it appears pale green ; when it does so *en masse* (the earliest symptom of decay), it is of a pale blue ; and in the last stage of decomposition, ferruginous. Having on the 27th Sept. brought home in several phials specimens of what I had presumed to be this plant in all its stages (i. e. from its first to last appearance as a colouring matter), I was much pleased to have the conjecture verified by microscopical examination. A portion taken from the surface when it appeared pale green, was under the microscope of as dark a hue as in July, whilst the blue and ferruginous colours exhibited different stages of decomposition. When in the most perfect state in which the plant has occurred to me, the globules appear entirely filled with granules, but when very highly magnified are each found to be surrounded by a hyaline membrane. The blue and ferruginous tufts exhibited generally the empty globules and the escaped granules scattered all about, but the former were seen in every state from full to empty : some had granules only in the centre, others were half-full, and some *separate* globules were entirely filled with the granular mass.

When two of the spiral portions come in contact, they have an elastic power, by which they can, though slowly, disentangle themselves and separate from each other,—a fact which

globular and escape in moniliform threads." It grows "on stones, aquatic plants, and the boards of sluices in early spring, forming a tuft of small crisped somewhat intricate bundles of filaments, of a beautiful deep green."
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In Ballydrain Lake I have, both in 1838 and 1839, remarked its presence in very calm days, for it is only at such times visible, during the months of July, August, and September, and then it appears in the most sheltered creeks only, floating in patches of various dimensions.

Under the separate heads of "Organologie" and "Physiologie de l'Aphanizomène," highly interesting details, which I must content myself with referring to, will be found in M. Morren's Memoir; as however this may not be accessible to all British botanists, it seems to me desirable that the following at least should be copied from it*.

"APHANIZOMENON†.

Filamenta simplicia, cylindrica, flexilia, membranacea, vitrea, articulata, articulis in lamellis planis, apice laciniatis, coadnatis, rectis aut hic et illic inflatis, materia viridi farctis, oscillantibus, sponte dissilientibus.

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SPECIES UNICA.

APHANIZOMENON INCURVUM, Nobis, vid. tab. fig. 1—12.

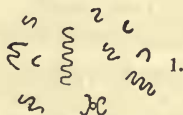
Lamella plana, alba-viridi, incurva, filis coadnatis, articulis 2—8 duplo longioribus, discretis, cæruleo-viridibus.

Habitat in fossis et stagnis aquæ dulcis in Flandria, mense Maio ad Julium.

“ Il est évident que ce genre lie les *conjugées* vrais aux *zygnémées*, par un accouplement bien prononcé chez ces derniers, mais devenant une simple soudure chez les *aphanizomènes*. Il met en rapport les *conjugées* avec les *laminaires* des eaux marines, par la forme de la lamelle qui résulte de la soudure des filets. Il établit une analogie entre les *oscillariées* et les *confervées*, en démontrant qu’un mouvement de reptation, de natation ou d’oscillation, peut appartenir aussi bien à l’organisation des conferves qu’à celle des oscillatoires, dans lesquels on croit reconnaître les caractères de l’animalité. Les vésicules renflées ramènent l’*aphanizomène* à la *Conferva vesicata* d’Agardh, et les articles, comme l’organisation des filets elle-même, lui conservent avec les *confervées* vrais des rapports si clairs, qu’il serait hors de propos de placer ailleurs que parmi elles ce genre nouveau.”



1. Appearance of *Anabaina spiralis* under a low power of microscope.



2. Its appearance considerably magnified—when consisting of this number of spiral folds $\frac{1}{50}$ of an inch in length.



3. Different appearance of granules as noted in description on Sept. 27.

XI.—*Contributions towards a knowledge of the Mollusca Nudibranchia and Mollusca Tunicata of Ireland, with Descriptions of some apparently new Species of Invertebrata.*
By WM. THOMPSON, Esq., V.P.N. Hist. Society of Belfast.

[With a Plate.]

MOLLUSCA NUDIBRANCHIA, Cuv.

DORIS TUBERCULATA, Cuv. Johnst. Ann. Nat. Hist. vol. i. p. 50. pl. 2. fig. 1. *D. argo*, Penn.

In the late Mr. Templeton’s Journal, “*Doris argo*, Penn., Brit. Zool. p. 22,” is mentioned as twice found by him in

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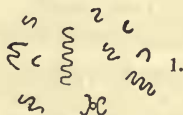
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Habitat in fossis et stagnis aquæ dulcis in Flandria, mense Maio ad Julium.

“ Il est évident que ce genre lie les *conjugées* vrais aux *zygnémées*, par un accouplement bien prononcé chez ces derniers, mais devenant une simple soudure chez les *aphanizomènes*. Il met en rapport les *conjugées* avec les *laminaires* des eaux marines, par la forme de la lamelle qui résulte de la soudure des filets. Il établit une analogie entre les *oscillariées* et les *confervées*, en démontrant qu’un mouvement de reptation, de natation ou d’oscillation, peut appartenir aussi bien à l’organisation des conferves qu’à celle des oscillatoires, dans lesquels on croit reconnaître les caractères de l’animalité. Les vésicules renflées ramènent l’*aphanizomène* à la *Conferva vesicata* d’Agardh, et les articles, comme l’organisation des filets elle-même, lui conservent avec les *confervées* vrais des rapports si clairs, qu’il serait hors de propos de placer ailleurs que parmi elles ce genre nouveau.”



1. Appearance of *Anabaina spiralis* under a low power of microscope.



2. Its appearance considerably magnified—when consisting of this number of spiral folds $\frac{1}{50}$ of an inch in length.



3. Different appearance of granules as noted in description on Sept. 27.

XI.—Contributions towards a knowledge of the Mollusca Nudibranchia and Mollusca Tunicata of Ireland, with Descriptions of some apparently new Species of Invertebrata. By WM. THOMPSON, Esq., V.P.N. Hist. Society of Belfast.

[With a Plate.]

MOLLUSCA NUDIBRANCHIA, Cuv.

DORIS TUBERCULATA, Cuv. Johnst. Ann. Nat. Hist. vol. i. p. 50. pl. 2. fig. 1. *D. argo*, Penn.

In the late Mr. Templeton’s Journal, “*Doris argo*, Penn., Brit. Zool. p. 22,” is mentioned as twice found by him in

SPECIES UNICA.

APHANIZOMENON INCURVUM, Nobis, vid. tab. fig. 1—12.

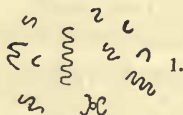
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